

A Redescription of the Indian Termite, *Odontotermes bellahunisensis* Holmg. & Holmg., with Description of a new Subspecies from Rajasthan

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(With 2 plates, 2 text-figures, and 5 tables)

CONTENTS

	PAGE
I. INTRODUCTION	580
II. REDESCRIPTION OF <i>Odontotermes bellahunisensis</i> HOLMG. & HOLMG. ..	581
III. DESCRIPTION OF NEW SUBSPECIES, <i>O. b. guptai</i> ..	588
IV. SUMMARY	593
REFERENCES	593
APPENDIX (ORIGINAL DESCRIPTION OF <i>O. bellahunisensis</i> H. & H.) ..	594

I. INTRODUCTION

The original description of the Indian termite *Odontotermes bellahunisensis* (Isoptera, family Termitidae, subfamily Metatermitinae) as given by Holmgren & Holmgren (1917, pp. 150-151) is extremely meagre and is unaccompanied by any illustrations, so that it is virtually impossible to recognise the species from the description alone. Fortunately, the cotype material, consisting of all the castes (alates, soldiers, and workers), is present with the Zoological Survey of India. We, therefore, take this opportunity to redescribe the species more fully and to give adequate illustrations for easy recognition. One of the cotype soldiers has been selected as the lectotype.

The species was hitherto known only from the original locality, viz. Bellahunisi (in the Bellary District) and Bangalore, both in the Mysore State, southern India. Recently, we found it from the arid zone of Rajasthan (western India) and Sind (West Pakistan), but these specimens constitute a new subspecies which we describe below.

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II. REDESCRIPTION OF *Odontotermes bellahunisensis*

HOLMGREN & HOLMGREN

Odontotermes bellahunisensis Holmgren & Holmgren

(Plates I & II; Text-fig. 1; Tables 1-3; and Appendix)

1917. *Odontotermes bellahunisensis* K. Holmgren & N. Holmgren, *Mem. Dept. Agr. India*, Calcutta 5 (3), pp. 150-151 (imagos, soldiers, and workers). *Type-localities* : INDIA : Mysore State : Bellahunisi (Bellary District), and Bangalore.

(a) MATERIAL

Two imagos, 6 soldiers, and 5 workers (1 major and 4 minor), all cotypes, in spirit in a vial, Z.S.I. Reg. No. 5616/20, from Bellahunisi, Bellary District¹, Mysore State, India, coll. *T. B. Fletcher*, 30-viii-1912, 'issuing from hole in gravelly soil at dusk. No mound at all.'

(b) DESCRIPTION

1. IMAGO (Table 1; and Plate 1).

General. Head-capsule and mandibles brownish yellow, apices of mandibles darker; clypeus labrum, and antennae pale yellowish white; eyes black with pale ocular sclerites; thorax and abdomen brownish yellow. Head and body densely covered with fine hairs. Total length (without wings and antennae) *c.* 11.6-12.3 mm.

Head. Head-capsule subcircular, broader than long (width with eyes 2.20-2.25 mm.; length 1.75-1.80 mm.); sides convex, posterior margin rounded; frons slightly sloping in front. *Fontanelle.* Small, rounded, not prominent; lying a little above the middle of head. *Eyes.* Present as a pair of large, subround compound eyes, one on either side, protruding laterally; maximum diameter 0.60-0.63 mm. *Ocelli.* Two lateral oval ocelli present, one on either side; separated from the eyes by a little more than half their long diameter. *Antennae.* With 18 segments; segment 1 cylindrical, longest; 2 more than half as long as 1; 3 subequal to 2 and partially subdivided into a proximal and a distal half; 4 shortest; 5 slightly longer than 4; 6-11 increasing in size in that order; 12-14 subequal, slightly longer than 11;

¹ Bellary District was formerly in the Madras State but was transferred to the Mysore State during the reorganisation of States in 1957.

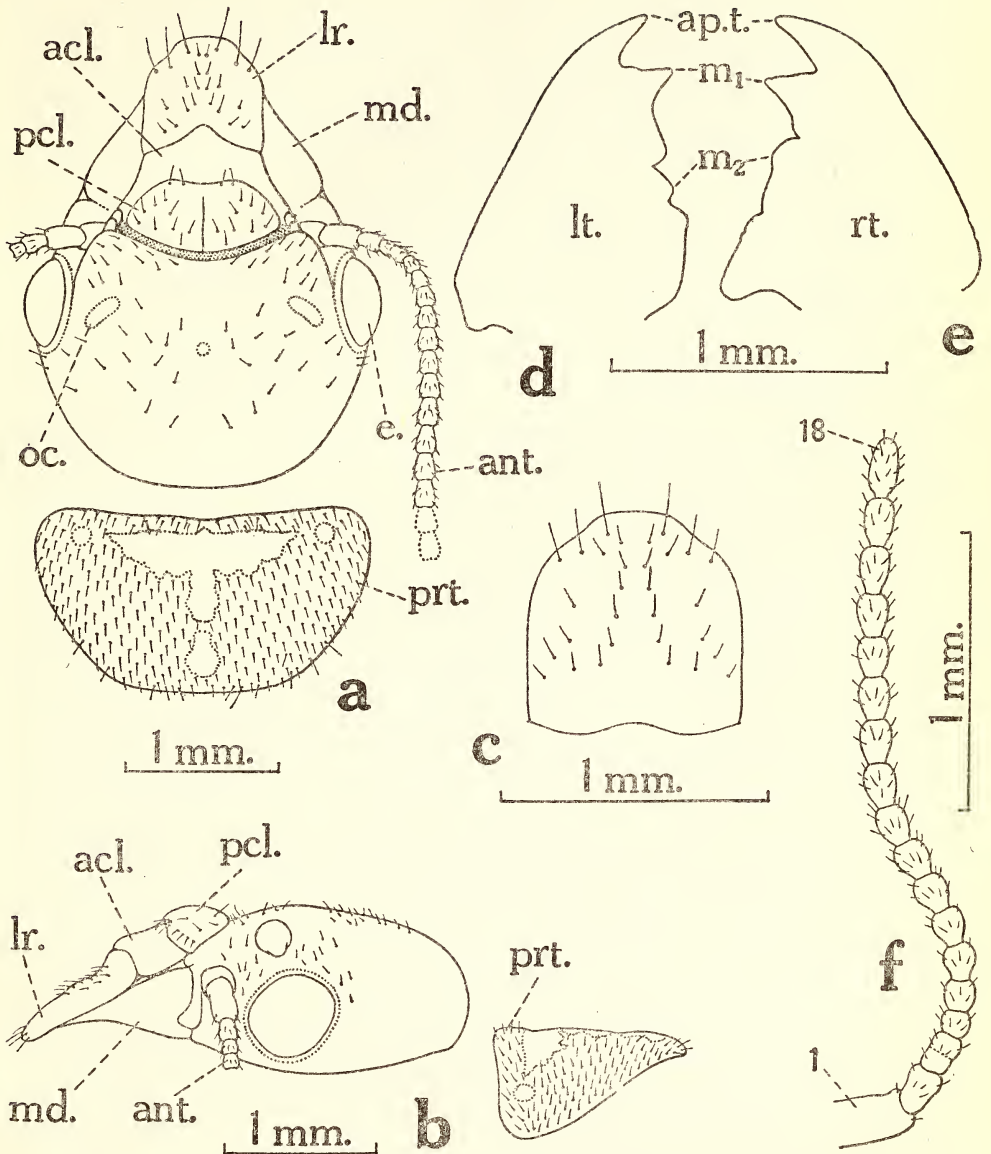
15-17 subequal, slightly longer than 14; apical (18) ovate, more slender and longer than the penultimate one. (In another specimen with an incomplete antenna, with 15 segments; segment 3 and 4 subequal; 5-14 increasing in size in that order; and 15 shorter than 14.)
Labrum. Tongue-shaped, broader than long; tip broadly rounded;

TABLE I

Body-measurements (in mm.) of imagos of *Odontotermes bellahunisensis* Holmgren & Holmgren : (Cotype lot)

Body-parts	Range (2 specimens)
I. GENERAL	
1. Total body-length (without wings) c.	.. 11.6-12.3
II. HEAD	
2. Length of head to lateral base of mandibles	.. 1.75-1.80
3. Max. width of head (with eyes)	.. 2.20-2.25
4. Max. height of head (including ocellus)	.. 1.00-1.10
5. Median length of labrum	.. 0.60-0.65
6. Max. width of labrum	.. 0.65-0.70
7. Max. diameter of compound eye (including ocular sclerite)	.. 0.60-0.63
8. Max. diameter of lateral ocellus	.. 0.23-0.25
9. Min. diameter of lateral ocellus	.. 0.20-0.23
10. Min. eye-ocellus distance	.. 0.13-0.15
11. Min. eye-antennal distance	.. 0.23-0.25
12. Min. ocellus-antennal distance	.. 0.25-0.28
III. THORAX	
13. Max. length of pronotum	.. 1.15-1.23
14. Max. width of pronotum	.. 2.10-2.25
15. Length of forewing scale	.. 1.10-1.13
16. Length of hindwing scale	.. 1.00-1.03

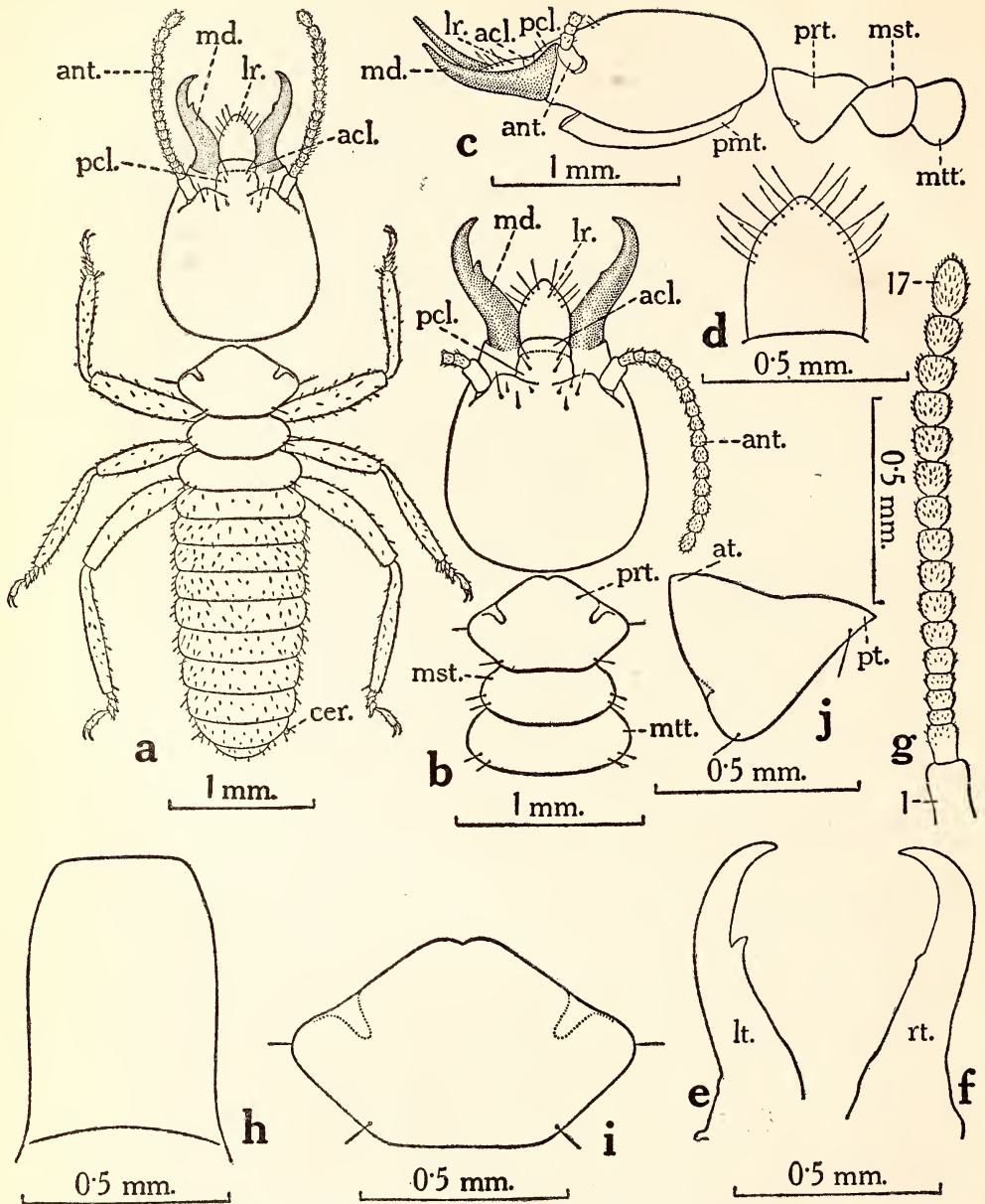
with a few hairs on tip and on body. *Clypeus*. Divided into an ante- and a postclypeus. Anteclypeus narrow, pentagonal, with a small pointed median tip; apilose. Postclypeus distinctly separated from



Odontotermes bellahunisensis Holmgren & Holmgren. Imago caste

Fig. a. Head and pronotum, in dorsal view; Fig. b. Head and pronotum, in lateral view; Fig. c. Labrum; Fig. d. Left mandible; Fig. e. Right mandible; Fig. f. Antenna
 acl., anteclypeus; ant., antenna; ap.t., apical tooth; e., eye; lr., labrum; lt. left; m₁, m₂, first and second marginal teeth of mandibles; md., mandible; oc., ocellus; pcl., postclypeus; prt., pronotum; rt., right

(All drawings are from the cotype imagos; see text)



Odontotermes bellahunisensis Holmgren & Holmgren. Soldier caste

Fig. a. Whole soldier, in dorsal view; Fig. b. Head and thorax, enlarged, in dorsal view; Fig. c. Head and thorax, in lateral view; Fig. d. Labrum; Fig. e. Left mandible; Fig. f. Right mandible; Fig. g. Left antenna; Fig. h. Postmentum; Fig. i. Pronotum, in dorsal view; Fig. j. Pronotum, in lateral view

acl., anteclypeus; ant., antenna; at., anterior; cer., cerci; lr., labrum; lt., left; md., mandible; mst., mesonotum; mtt., metanotum; pcl., postclypeus; prt., pronotum; pt., posterior; rt., right

(All drawings are from the lectotype soldier, from the cotype collection from Bellahunisi, Bellary District, Mysore State, India, present in the Zoological Survey of India, Calcutta)

frons by a semicircular demarcation, strongly swollen and divided into right and left halves by a median suture. *Mandibles*. Of the *Odontotermes*-type. Right mandible with an apical and 2 marginal teeth; apical long, bluntly finger-like; 1st marginal triangular, slightly shorter than apical; 2nd short and blunt. Left mandible with an apical and 2 marginal teeth; apical long, finger-like; 1st marginal triangular, almost as long as apical; 2nd very short and blunt and widely separated from the 1st.

Thorax: Pronotum. Trapezoidal, broader than long (width 2.10-2.25 mm.; length 1.15-1.23 mm.); either narrower or subequal to head-width (with eyes); with a T-shaped apilose mark in the centre, and indistinct shoulder spots on antero-lateral corners; anterior margin slightly upturned, with a weak median notch; anterior and posterior angles rounded; posterior margin straight, without a median notch. *Wings*. Broken in the specimens available to us; only wing-scales present. *Forewing scale*. Triangular, 1.10-1.13 mm. long. *Hindwing scale*. Also triangular; shorter than forewing scale (length 1.00-1.03 mm.). *Legs*. Long, tubular, densely pilose; tibial spur formula: 3 : 2 : 2. *Abdomen*. Elongate, densely pilose. Cerei 2-jointed; 0.15 mm. long. Styli, single-jointed; 0.05 mm. long.

2. SOLDIER (Table 2; and Plate II)

General. Head-capsule, antennae, thorax and body pale yellowish-white. Mandibles light reddish-brown. Head and body sparsely pilose. Total length (including mandibles but excluding antennae) c. 3.95-5.03 mm.

Head. Head-capsule rectangularly oval; longer than broad (length to base of mandibles 1.18-1.33 mm.; maximum width 1.03-1.15 mm.), converging anteriorly; rounded at posterior end; frons slightly sloping in front. *Fontanelle*. Indistinct. *Eyes and ocelli*. Absent. *Antennae*. With 16-17 segments; segment 1 cylindrical, longest; 2 cylindrical, a little more than half of 1; 3 shortest in the 17-segmented antenna, and 4 shortest in the 16-segmented antenna; 5 to the penultimate one progressively increasing in size; apical oval, longer than penultimate one. *Clypeus*. Separated into an ante- and a postclypeus. Anteclypeus narrow, hyaline, apilose. Postclypeus indistinctly separated from frons and with a few long hairs. *Labrum*. Tongue-shaped, basally broad, apically converging to a slightly pointed tip; several long and short hairs present near tip and on body. *Mandibles*. Short, stout, basally broad, sickle-shaped and strongly incurved at apex. Right mandible with a minute tooth above the

TABLE 2

Body-measurements (in mm.) and indices of soldiers of
Odontotermes bellahunisensis Holmgren & Holmgren :
(Cotype lot)

Body-parts	Range (6 specimens)	Lectotype
I. GENERAL		
1. Total body-length (without antennae) c. ..	3.95-5.03	4.65
II. HEAD		
2. Head-length up to base of mandibles ..	1.18-1.33	1.20
3. Max. width of head ..	1.03-1.15	1.05
4. Max. height of head ..	0.60-0.65	0.60
5. Head Index I (Width/Length) ..	0.86-0.89	0.88
6. Head Index II (Height/Width) ..	0.52-0.61	0.57
7. Head Index III (Height/Length) ..	0.47-0.52	0.50
8. Head Index IV (Mandible length/Head-length) ..	0.52-0.57	0.57
9. Median length of labrum ..	0.30-0.35	0.30
10. Max. width of labrum ..	0.28	0.25
11. Min. length of mandible		
(a) Left mandible ..	0.65-0.73	0.69
(b) Right mandible ..	0.65-0.73	0.70
12. Distance of tooth from apex of mandible (left) ..	0.2-0.25	0.23
13. Min. median length of postmentum ..	0.63-0.70	0.65
14. Max. width of postmentum ..	0.45-0.55	0.48
15. Width of postmentum at anterior margin ..	0.28-0.35	0.30
III. THORAX		
16. Max. length of pronotum ..	0.50-0.53	0.50
17. Max. width of pronotum ..	0.75-0.90	0.80
18. Max. width of mesonotum ..	0.65-0.78	0.70
19. Max. width of metanotum ..	0.78-0.93	0.85
20. No. of antennal segments ..	16-17	17

middle on its inner margin. Left mandible, with a large blunt tooth at its distal third (index Tooth distance/Mandibular length 0.29-0.34). *Postmentum*. Parallel-sided, longer than broad (length 0.63-0.70 mm.; width 0.50-0.55 mm.), slightly converging anteriorly.

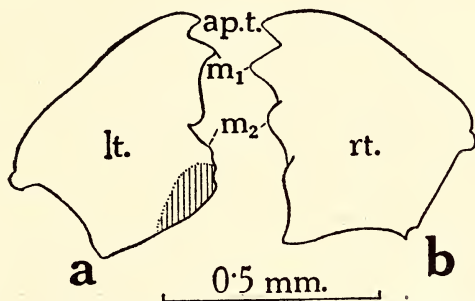
Thorax: Pronotum. Weakly saddle-shaped, broader than long (width 0.75-0.90 mm.; length 0.50-0.53 mm.); anteriorly sharply narrowing; anterior margin with a median notch; posterior margin substraight. *Mesonotum*. Suboval, broader than long; narrower than pronotum; sides rounded; posterior margin weakly convex. *Metanotum*. Suboval; broader than pronotum; much broader than

long; sides rounded; posterior margin substraight. *Legs.* Long, pilose; apical tibial spur formula 3 : 2 : 2.

Abdomen. Oblong, elongate, moderately pilose. Cerci 2-jointed, 0.05 mm. long. Styli one-jointed, 0.05 mm. long.

3. WORKER MAJOR (Table 3; and Text-fig. 1)

General. Head-capsule pale yellowish white; apices of mandibles and mandibular teeth dark brown. Thorax and abdomen pale yellowish-white. Head and body moderately pilose. Total length (without antennae) c. 3.7 mm.



TEXT-FIG. 1. *Odontotermes bellahunisensis* Holmgren & Holmgren. Mandibles of worker major. (From the cotype lot)

ap.t., apical tooth; lt., left; m_1 , m_2 , first and second marginal teeth of mandibles; rt., right

Head. Head-capsule subsquarish, broader than long (width 1.13 mm.; length 1.08 mm.), flattened on top; sides straight; posteriorly rounded. *Fontanelle.* Indistinct. *Eyes and ocelli.* Absent. *Antennae.* With 17 segments; segment 1 longest, cylindrical; 2 cylindrical, more than half as long as 1; 3 shortest; 4-17 (apical) progressively increasing in size; apical (17) ovate, club-shaped, longer than the penultimate one. *Labrum.* Short, broad, tongue-shaped, with a broad tip; with a few long hairs near tip and on body. *Clypeus.* Divided into an ante- and a postclypeus. Anteclypeus an apilose, narrow, strip, with a short pointed tip. Postclypeus swollen, with a few short hairs; separated from frons by a semicircular demarcation; divided into right and left halves by a median suture. *Mandibles.* Of the typically *Odontotermes*-type; teeth rather blunt and short. Right mandible with an apical and 2 marginal teeth; apical short, finger-like, 1st marginal broadly triangular, longer than apical; 2nd short, blunt, with the posterior margin longer than the anterior. Left mandible with an

TABLE 3

Body-measurements (in mm.) of workers (major and minor of)
Odontotermes bellahunisensis Holmgren & Holmgren : (Cotype lot)

Body-parts	Range (mm.)	
	Worker Major (1 specimen)	Workers Minor (4 specimens)
1. Total body-length (without antennae) c. ..	3.70	3.00-3.60
2. Length of head to base of mandibles ..	1.08	0.70-0.75
3. Max. width of head	1.13	0.78-0.85
4. Max. height of head	0.53	0.35-0.40
5. Max. length of pronotum	0.40	0.35-0.40
6. Max. width of pronotum	0.63	0.53-0.60
7. Max. width of mesonotum	0.58	0.53-0.58
8. Max. width of metanotum	0.85	0.70-0.75
9. No. of antennal segments	17	16-17

apical and 2 marginal teeth; apical short, finger-like; 1st marginal triangular, slightly longer than apical; 2nd marginal minute, only slightly demarcated from margin and widely separated from 1st marginal.

Thorax: Pronotum. Saddle-shaped, broader than long, (width c. 0.63 mm.; length c. 0.40 mm.); anterior lobe strongly upturned, slightly notched medially; anterior angles narrowly, and posterior angles broadly, rounded; sides and posterior margin straight. *Mesonotum.* Suboval; much broader than long; narrower than pronotum; posterior margin straight. *Metanotum.* Suboval; much broader than long; broader than pronotum; posterior margin straight. *Legs.* Slightly swollen, moderately pilose; apical tibial spur formula 3 : 2 : 2.

Abdomen. Oblong, moderately pilose. Cerci 2-jointed; 0.05 mm. long. Styli one-jointed; 0.08 mm. long.

4. WORKER MINOR (Table 3)

Generally resembles worker major, but is smaller. *Head* sub-squarish with straight sides, converging posteriorly to rounded margin.

Antennae with 16-17 segments; segment 3 varying—either shorter, or longer than, or subequal to 4.

(c) TYPE-SPECIMENS AND TYPE-LOCALITY

Cotypes. The following cotype material is present in spirit, in a vial, with the Zoological Survey of India, Calcutta: 2 winged imagos (wings damaged), 6 soldiers, and 5 workers (1 major and 4 minor). Bellahunisi (Bellary District, Mysore State¹, India), coll. *T. B. Fletcher*, 30-viii-1912.

Lectotype etc. Out of the above, we select one soldier (now placed in a separate vial, under Z.S.I. Reg. No. 2651/H8) as the *lectotype* and the remaining 5 soldiers in a vial, Z.S.I. Reg. No. 2661/H8, as the *paralectotypes*. The remaining cotype material (2 imagos and 5 workers) is in the original vial, Z.S.I. Reg. No. 5616/20.

Type-locality. Bellahunisi (southern India), as above.

(d) GEOGRAPHICAL DISTRIBUTION

The typical species is confined to southern India (Bellahunisi and Bangalore), but we have recently found a new subspecies further north, from the arid areas of western Rajasthan (India) and Sind (W. Pakistan). The new subspecies is described below.

(e) COMPARISONS

Odontotermes bellahunisensis is very close to the Indian species *O. obesus* (Rambur) and *O. redemanni* (Wasmann), from which, however, it is distinguishable as follows:

(a) IMAGOS

1. From *O. obesus* (the type-specimen of *O. obesus*, lodged in the Hope Collection, Oxford, was examined): (i) Head-capsule shorter and narrower (head-length to base of mandibles 1.75-1.80 mm. v. 2.00 mm., head-width with eyes 2.20-2.32 mm. v. 2.66 mm.). (ii) Eyes smaller (maximum diameter 0.60-0.65 mm. v. 0.70 mm.).

¹ See footnote above, p. 581.

(iii) Ocelli smaller (maximum diameter 0.23-0.25 mm. v. 0.30 mm.); separated from eyes by a distance of more than half its maximum diameter (v. less than half its maximum diameter in *obesus*). (iv) Pronotum smaller (length 1.14-1.23 mm. v. 1.47 mm.; maximum width 2.10-2.25 mm. v. 2.50 mm.).

2. From *O. redemanni*: (i) Head-capsule narrower (head-width with eyes 2.20-2.32 mm. v. 2.66 mm.). (ii) Ocelli separated from the eye of its side by more than half its (i.e. of ocellus) diameter (in *redemanni*, by half its diameter).

(b) SOLDIERS

1. From *O. obesus*: (i) Mandibles shorter, stouter, and more incurved (ratio Mandible-length/Head-length to lateral base of mandibles, 0.52-0.57 v. 0.59-0.70 in *obesus* (vide Roonwal & Sangal, 1960). (ii) Pronotum without a median notch (a weak depression present in one subspecies) in posterior margin (v. with a well-marked notch).

2. From *O. redemanni*: (i) Mandibles shorter and more strongly incurved. (ii) Pronotum differs as in *O. obesus* above.

III. DESCRIPTION OF NEW SUBSPECIES, *O. b. guptai*

***Odontotermes bellahunisensis guptai* subsp. nov.**

(Text-fig. 2; and Tables 4 & 5)

(a) MATERIAL

LOT (A): 2 tubes with 6 soldiers and several workers, coll. S. D. Gupta, near Bikaner, Rajasthan, India, as follows:

- (i) No. T-21/16-7-52, Shivbari, Bikaner, 16-vii-1952, ex 'ground';
- (ii) No. T-23/16-7-52, Ratanbai Quarters, Bikaner, 16-vii-1952.

LOT (B): 2 tubes with 6 soldiers and several workers, coll. S. Biswas, western Rajasthan, India, as follows. (iii) No. 1/24-10-58, Gudha near Sambhar Lake (Nagaur Dist.), 24-x-1958; (iv) No. 3/15-11-58, Sayadpura Salt Colony, near Sambhar Lake (Nagaur Dist.), 15-xi-1958.

LOT (C): 4 tubes with several soldiers and workers, West Pakistan, as follows: (v-vi) Karachi Air Port, near wireless station, coll. A. Khan, 13-ix-1960, ex 'cowdung'; (vii-viii) Behind 'Federal Capital Area', c. 10-12 km. from Karachi, coll. Sohrab Ali, 13-ix-1960, ex 'rotten wood'.

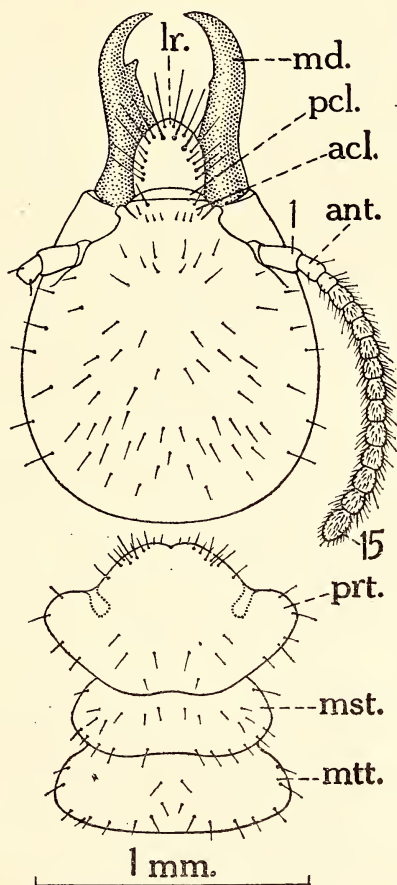
(b) DESCRIPTION

1. IMAGO

Unknown.

2. SOLDIER (Table 4; and Text-fig. 2)

General. Head-capsule deep golden brown to dark brown; antennae basally pale yellow, apically deep brownish yellow; anteclypeus whitish, hyaline; mandibles basally pale, apically reddish brown; thorax and abdomen yellowish white. Head and body moderately pilose. Total length (with mandibles but without antennae) *c.* 3.86-4.93 mm.

TEXT-FIG. 2. *Odontotermes bellahunisensis guptai* subsp. nov.

Head and thorax of soldier, in dorsal view (From a paratype, near Gudha village, Nagaur District, Rajasthan)

acl., anteclypeus; ant., antenna (with segments 1-15); lr., labrum; md. mandible; mst., mesonotum; mtt., metanotum; pcl., postclypeus; prt., pronotum.

TABLE 4
Body-measurements (in mm.) of soldiers of
Odontotermes bellahunisensis guptai subsp. nov.

Body-parts	Range (10 specimens)	Holotype
I. GENERAL		
1. Total length (including mandibles and excluding antennae) c. ..	3.86-4.93	3.86
II. HEAD		
2. Head-length to base of mandibles ..	1.08-1.20	1.08
3. Max. width of head ..	0.98-1.08	0.98
4. Max. height of head ..	0.60-0.63	0.60
5. Head Index I (Head-width/Head-length) ..	0.87-0.95	0.90
6. Head Index II (Head-height/Head-length)..	0.50-0.56	0.55
7. Head Index III (Head-height/Head-width)..	0.56-0.61	0.61
8. Head Index IV (Mandible-length/Head-length) ..	0.52-0.57	0.55
9. Median length of labrum ..	0.25-0.28	0.25
10. Max. width of labrum ..	0.23-0.28	0.23
11. Min. median length of mandibles :		
(a) Right mandible ..	0.60-0.65	0.60
(b) Left mandible ..	0.58-0.65	0.60
12. Distance of tooth on left mandible from apex of mandible ..	0.15-0.20	0.20
13. Tooth Index. (Distance of tooth from apex/Mandible-length) ..	0.25-0.33	0.33
14. Median length of postmentum ..	0.63-0.65	0.63
15. Max. width of postmentum ..	0.45-0.48	0.45
16. Width at anterior margin of postmentum ..	0.33-0.35	0.33
III. THORAX		
17. Max. length of pronotum ..	0.48-0.55	0.48
18. Max. width of pronotum ..	0.73-0.85	0.73
19. Max. width of mesonotum ..	0.63-0.73	0.63
20. Max. width of metanotum ..	0.78-0.88	0.78
21. No. of antennal segments ..	15-16	15

Head. Head-capsule suboval; longer than broad (length 1.08-1.20 mm., breadth 0.98-1.08 mm.); converging anteriorly, posteriorly rounded. *Fontanelle.* Indistinct. *Eyes and ocelli.* Absent. *Antennae.* With 15-16 segments; segment 1 longest; 2 about two-thirds of 1; 3 generally shortest, or sometimes 4 shortest; 4 longer than 3 but sometimes subequal to or even shorter than the latter; 5 longer than 3 or 4; 6 onwards gradually increasing in size in that order; apical (15 or 16) ovate, longer than the penultimate one. *Labrum.* Tongue-shaped, longer than broad, with strong hairs bordering the sides and 2 pairs of long ones near the tip. *Clypeus.* Divided into an ante- and a postclypeus. Anteclypeus, a narrow, subtrapezoidal, apilose strip, distinctly separated from postclypeus. Postclypeus indistinctly separated from frons; with 2 prominent hairs on anterior margin. *Mandibles.* Short, stout and deeply curved inwards to a sharp tip. Left mandible with a strong tooth lying at one-third the length of mandible from the apex. Right mandible with a minute tooth a little below the distal third from apex. *Postmentum.* More or less parallel-sided; longer than broad (length 0.63-0.65 mm.; width 0.33-0.35 mm.), slightly converging anteriorly; with a few hairs near and on the anterior margin; anterior margin substraight; posterior margin concave.

Thorax: Pronotum. Saddle-shaped, broader than long; anterior margin semicircular, slightly notched in middle; sides straight, converging to a deeply-notched posterior margin.

Mesonotum. Subovate; broader than long; with a weak median notch in posterior margin. *Metanotum.* Suboval, much broader than long; posteriorly weakly concave; posterior margin with a weak median notch. *Legs.* Long; femora slightly swollen; sparsely pilose; apical tibial spur formula 3 : 2 : 2.

Abdomen. Elongate, oval. Cerci 2-jointed; 0.08 mm. long. Styli single-jointed; 0.08 mm. long.

3. WORKER (Table 5)

Similar to that of the typical form *O. b. bellahunisensis*, described above, with minor differences as follows: It is not possible to separate 'major' and 'minor' workers. The number of antennal segments is usually 17, but sometimes 16.

(c) TYPE-SPECIMENS

Holotype. One soldier, in spirit, in a vial, Z.S.I. Reg. No. 2652/H8, near Gudha village (Nagaur Dist., Rajasthan), coll. S. Biswas (Field

TABLE 5

Body-measurements (in mm.) of workers of
Odontotermes bellahunisensis guptai subsp. nov.

Body-parts	Range (8 specimens)
1. Total length (excluding antennae) c.	2.48 - 3.90
2. Head-length to base of mandibles	0.98 - 1.20
3. Max. width of head	1.08 - 1.30
4. Max. height of head	0.50 - 0.60
5. Max. length of pronotum	0.33 - 0.53
6. Max. width of pronotum	0.53 - 0.70
7. Max. width of mesonotum	0.60 - 0.68
8. Max. width of metanotum	0.75 - 0.90
9. No. of antennal segments	16 - 17

Coll. No. 1/24-10-58), 24-x-1958; deposited in the National Zoological Collections, Zoological Survey of India, Calcutta.

Morphotype. One worker in spirit in a vial, Z.S.I. Reg. No. 2653/H8, from the holotype lot and with the same data. Deposited in the Zoological Survey of India, Calcutta.

Paratypes and *Paramorphotypes*. Deposited as follows: (i) Four paratype soldiers and four paramorphotype workers, in spirit in a vial, Z.S.I. Reg. No. 2654/H8, from the holotype lot and with the same data, in the Zoological Survey of India, Calcutta. (ii) One paratype soldier and two paramorphotype workers, in spirit in a vial, from material No. T-21/16-7-52, Shivbari, Bikaner, coll. S. D. Gupta, with Prof. A. E. Emerson, Department of Zoology, Chicago University, Chicago, U.S.A. (iii) One paratype soldier and one paramorphotype worker, from same material as (ii), in the Entomological Collections, Forest Research Institute, Dehra Dun.

(d) TYPE-LOCALITY

INDIA. Rajasthan: Near Gudha village (approx. 26° 55' N. lat. and 75° 25' E. long.), Nagaur District.